

well colour'd Yellow, and further and further from the edge, as the liquor grew thicker and thicker, this tincture appear'd deeper and deeper, so that near the blunt end, which was seven Inches from the edge and three Inches and an half thick; it was of a deep and well colour'd Red. Now, the clearer and purer this tincture be, the more lovely will the deep Scarlet be; and the fouler the tincture be, the more dirty will the Red appear; so that some dirty tinctures have afforded their deepest Red much of the colour of burnt Oker or *Spanish* brown; others as lovely a colour as *Vermilion*; and some much brighter; but several others, according as the tinctures were worse or more foul, exhibited various kinds of Reds, of very differing degrees.

The other of these Wedges, I fill'd with a most lovely tincture of Copper, drawn from the filings of it, with spirit of *Urine*, and this Wedge held as the former against the Light, afforded all manner of Blues, from the faintest to the deepest, so that I was in good hope by these two, to have produc'd all the varieties of colours imaginable; for I thought by this means to have been able by placing the two *Parallelogram* sides together, and the edges contrary ways, to have so mov'd them to and fro one by another, as by looking through them in several places, and through several thicknesses, I should have compounded, and consequently have seen all those colours, which by other like compositions of colours would have ensued.

But instead of meeting with what I look'd for, I met with somewhat more admirable; and that was, that I found my self utterly unable to see through them when placed both together, though they were transparent enough when asunder; and though I could see through twice the thickness, when both of them were fill'd with the same colour'd liquors, whether both with the Yellow, or both with the Blue, yet when one was fill'd with the Yellow, the other with the Blue, and both looked through, they both appear'd dark, onely when the parts near the tops were look'd through, they exhibited Greens, and those of very great variety, as I expected, but the Purples and other colours, I could not by any means make, whether I endeavour'd to look through them both against the Sun, or whether I plac'd them against the hole of a darkned room.

But notwithstanding this mis-guessing, I proceeded on with my trial in a dark room, and having two holes near one another, I was able, by placing my Wedges against them, to mix the ting'd Rays that pass through them, and fell on a sheet of white Paper held at a convenient distance from them as I pleas'd; so that I could make the Paper appear of what colour I would, by varying the thicknesses of the Wedges, and consequently the tincture of the Rays that pass through the two holes, and sometimes also by varying the Paper, that is, instead of a white Paper, holding a gray, or a black piece of Paper.

Whence I experimentally found what I had before imagin'd, that all the varieties of colours imaginable are produc'd from several degrees of these two colours, namely, Yellow and Blue, or the mixture of them with light and darkness, that is, white and black. And all those almost infinite varieties which Limners and Painters are able to make by compounding

pounding those several colours they lay on their Shells or *Palads*, are nothing else, but some *compositum*, made up of some one or more, or all of these four.

Now, whereas it may here again be objected, that neither can the Reds be made out of the Yellows, added together, or laid on in greater or less quantity, nor can the Yellows be made out of the Reds though laid never so thin; and as for the addition of White or Black, they do nothing but either whiten or darken the colours to which they are added, and not at all make them of any other kind of colour: as for instance, *Vermilion*, by being temper'd with White Lead, does not at all grow more Yellow, but onely there is made a whiter kind of Red. Nor does Yellow *Oker*, though laid never so thick, produce the colour of *Vermilion*, nor though it be temper'd with Black, does it at all make a Red; nay, though it be temper'd with White, it will not afford a fainter kind of Yellow, such as *maficut*, but onely a whiten'd Yellow; nor will the Blues be *diluted* or deepned after the manner I speak of, as *Indico* will never afford so fine a Blue as *Ultramarine* or *Bise*; nor will it, temper'd with *Vermilion*, ever afford a Green, though each of them be never so much temper'd with white.

To which I answer, that there is a great difference between *diluting* a colour and whitening of it; for *diluting* a colour, is to make the colour'd parts more thin, so that the ting'd light, which is made by trajecting those ting'd bodies, does not receive so deep a tincture; but whitening a colour is onely an intermixing of many clear reflections of light among the same ting'd parts; deepning also, and darkning or blacking a colour, are very different; for deepning a colour, is to make the light pass through a greater quantity of the same tinging body; and darkning or blacking a colour, is onely interposing a multitude of dark or black spots among the same ting'd parts, or placing the colour in a more faint light.

First therefore, as to the former of these operations, that is, *diluting* and deepning, most of the colours us'd by the Limners and Painters are incapable of, to wit, *Vermilion* and *Red-lead*, and *Oker*, because the ting'd parts are so exceeding small, that the most curious Grindstones we have, are not able to separate them into parts actually divided so small as the ting'd particles are; for looking on the most curiously ground *Vermilion*, and *Oker*, and *Red-lead*, I could perceive that even those small *corpuscles* of the bodies they left were compounded of many pieces, that is, they seem'd to be small pieces compounded of a multitude of lesser ting'd parts: each piece seeming almost like a piece of Red Glas, or ting'd Crystal all flaw'd; so that unless the Grindstone could actually divide them into smaller pieces then those flaw'd particles were, which compounded that ting'd mote I could see with my *Microscope*, it would be impossible to *dilute* the colour by grinding, which, because the finest we have will not reach to do in *Vermilion* or *Oker*, therefore they cannot at all, or very hardly be *diluted*.

Other colours indeed, whose ting'd particles are such as may be made smaller, by grinding their colour, may be *diluted*. Thus several of the